REMARKS

Applicants have carefully considered this Application in connection with the Examiner's Action, and respectfully request reconsideration of this Application in view of the above Amendment and the following remarks.

Applicants have amended Claims 1 – 4 to specify that the carbon nanotubes have one or more gases absorbed or adsorbed thereto, that they are subjected to microwave irradiation in an inert gas chamber or a vacuum chamber, and that the microwave irradiation causes the desorption of the gases from the carbon nanotubes. Claims 5 and 8 have been cancelled. Applicants have also amended Claims 9 and 10 to depend from Claim 1 rather than cancelled Claim 8 and to clarify the claim dependency. Claims 12 – 38 have been cancelled. Finally, new Claims 39 – 53 have been added which correspond to claims 6, 7, 9, 10, and 11 but depend from independent Claims 1 – 3.

Pending in this application are Claims 1 – 4, 6 – 7, 9 – 11, and 39 – 53.

I. Provisional Double Patenting Rejection

The pending claims of this application stand provisionally rejected under the doctrine of obviousness-type double patenting as being unpatentable over Claims 62 – 108 of copending Application Serial No. 10/846,045. Applicants respectfully disagree with this provisional rejection. Co-pending Application Serial No. 10/846,045 deals with the release of energy, e.g. thermal and light energy. The current application specifically deals with the desorption of gases from carbon nanotubes having the gases absorbed or adsorbed thereto. These released gasses are used as fuel to generate energy and perform tasks, while the carbon nanotubes are merely a transport device. The claims of the current application do not pertain to the use of thermal energy. For that reason, the claims of the two co-pending applications are patentably distinct.

II. Rejections Under 35 U.S.C. §102(b)

A. Korean Patent No. 2002-0046342 to Lee

Claims 1 – 4, 6, and 7 stand rejected under 35 U.S.C. §102(b) as being anticipated by Korean Patent No. 2002-0046342 to Lee ("Lee"). Applicant has amended Claims 1 – 4 to incorporate the limitations of Claims 5 and 8. Amended Claims 1 – 4 now require that the carbon nanotubes be

subjected to microwave irradiation in an inert gas chamber or in a vacuum chamber. These claim limitations are not disclosed by Lee. Thus, the claims as amended are not anticipated by Lee. Applicants respectfully ask that this rejection be withdrawn.

B. U.S. Patent Publication No. 2002/0183207 to Hjorstam et al.

Claims 1 – 4, 6, and 7 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent Publication No. 2002/0183207 to Hjorstam et al. ("Hjorstam"). Applicant has amended Claims 1 – 4 to incorporate the limitations of Claims 5 and 8. Amended Claims 1 – 4 now require that the carbon nanotubes be subjected to microwave irradiation in an inert gas chamber or in a vacuum chamber. The Examiner has indicated that Hjorstam does not teach that the carbon nanotubes are subjected to microwave irradiation while in an inert gas chamber or a vacuum chamber. See Office Action Dated April 6, 2006 at page 5. Thus, the claims as amended are not anticipated by Hjorstam. Applicants respectfully ask that this rejection be withdrawn.

III. Rejections Under 35 U.S.C. §103(a)

Claims 5, 8, and 9 – 11 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Hjorstam in view of U.S. Patent No. 6,423,605 to Sklyarevich et al. ("Sklyarevich") or U.S. Patent No. 6,203,864 to Zhang et al. ("Zhang"). The Examiner has asserted that it would have been obvious in view of Sklyarevich or Zhang to utilize an inert gas chamber or a vacuum chamber for the microwave irradiation of the carbon nanotubes. Thus, although Applicants have cancelled Claims 5 and 8, Applicants assume that the Examiner would now apply the same rejection to amended Claims 1 – 4, which have been amended to incorporate the limitations of Claims 5 and 8.

Applicants respectfully assert that neither Sklyarevich nor Zhang teach or suggest the use of carbon nanotubes with gases absorbed or adsorbed thereto. Furthermore, neither Sklyarevich nor Zhang teaches that irradiation of these carbon nanotubes in an inert gas chamber or a vacuum chamber would result in the desorption of these gases from the carbon nanotubes. Finally, neither Sklyarevich nor Zhang teaches the use of an inert gas chamber or a vacuum chamber under these conditions and utilizing the claimed carbon nanotubes to produce the claimed effects.

The claims as amended require that the method utilize carbon nanotubes having one or more gases absorbed or adsorbed thereto. Sklyarevich does not teach or suggest the use of carbon

nanotubes at all, much less those with gases absorbed or adsorbed. Sklyarevich refers only generally to semiconductor material and emphasizes that it has a crystalline lattice material, such as Si or GaAs. See Sklyarevich, col. 4, ll. 8 – 24. A person of skill in the art would not interpret the teachings of Sklyarevich as being applicable to carbon nanotubes. As is well known to those in the industry, dealing with carbon nanotubes is a complicated process requiring extremely different techniques than are required with silicon semiconductors. In addition, carbon nanotubes are constructed of carbon without impurities in tube shapes or bundles, while Sklyarevich teaches the use of semiconductor material having a lattice shape, charge carrier electrons, holes, and impurity ions. See Sklyarevich, col. 4, ll. 19 – 24. Thus, Sklyarevich's teachings would not be applicable to the use of carbon nanotubes and certainly do not suggest the use of carbon nanotubes with gases absorbed or adsorbed thereto.

Zhang does teach carbon nanotubes but does not teach nanotubes having gases absorbed or adsorbed thereto. Rather, Zhang is concerned with contacting a carbon nanotube with a reactive material such as silicon to produce a heterojunction of carbon nanotube and carbide. See Zhang, col. 3, ll. 18 – 22. Zhang does not discuss nor suggest the release of gases from carbon nanotubes. Because Zhang is concerned with the reactivity of the carbon nanotubes with the reactive substance, Zhang actually teaches away from the release of gases or any other change that could be induced in the carbon nanotubes that would adversely effect its reactivity. Thus, Zhang does not teach the carbon nanotubes required in the current claims.

Because neither Sklyarevich nor Zhang teaches the use of carbon nanotubes having gases absorbed or adsorbed thereto, neither Sklyarevich nor Zhang can possibly teach the desorption of these gases after microwave irradiation of the carbon nanotubes. The Examiner has asserted that this effect is inherent in the teachings of Sklyarevich and Zhang, but such a final result cannot be inherent in the methods disclosed in these references because neither reference utilizes the necessary starting materials. Thus, neither Sklyarevich nor Zhang teaches the desorption of gases from the carbon nanotubes, as is required by the claims.

Finally, neither Sklyarevich nor Zhang teaches or suggests an inert gas chamber or a vacuum chamber used to irradiate carbon nanotubes having absorbed or adsorbed gases. As already noted, Sklyarevich does not disclose carbon nanotubes at all. Sklyarevich's disclosure of a gas that does

not influence the activation process is not applicable to the current claims because Sklyarevich does not utilize carbon nanotubes. Furthermore, Sklyarevich uses the cooled gas to prevent diffusion of the dopant material, or impurity ions, which are inserted into the semiconductor material. See Sklyarevich, col. 6, ll. 56 – 67. Skylarevich does not utilize inert gas with carbon nanotubes alone and therefore its teachings would not suggest the inert gas chamber of the claimed subject matter to a person of skill in the art. The Examiner also asserts that Sklyarevich teaches a vacuum chamber. Sklyarevich does disclose a "chamber 10" in Figure 2, but nowhere does Sklyarevich teach or suggest that this chamber is a vacuum chamber. Sklyarevich does not teach the use of vacuum pressure in association with its disclosed methods at any point.

Zhang teaches the use of a vacuum or an inert gas for holding the reactive substance to which the carbon nanotube is applied. See Zhang, col. 4, ll. 12 – 13. Zhang also suggests that the heating of the reactive substance in contact with the carbon nanotube can be carried out in a vacuum and also in a nitrogen or argon atmosphere. See Zhang, col. 5, lines 11 – 12. However, these teachings cannot be applied to the claimed subject matter because Zhang is concerned with the reaction of a carbon nanotube with a substance to produce a carbide. Zhang does not pertain to microwave irradiation of a carbon nanotube having gases absorbed or adsorbed thereto, and Zhang does not disclose the desorption of these gases from the carbon nanotube. Thus, a person of skill in the art would not interpret any of Zhang's preferred embodiments or reaction conditions as being applicable to the current claimed subject matter.

For these reasons, the pending claims are patentable over Hjorstam in view or Sklyarevich or Zhang.

IV. Conclusion

Applicants respectfully submit that, in light of the foregoing comments, Claims 1 – 4, 6 – 7, 9 – 11, and 39 – 53 are in condition for allowance. A Notice of Allowance is therefore requested.

If the Examiner has any other matters which pertain to this Application, the Examiner is encouraged to contact the undersigned to resolve these matters by Examiner's Amendment where possible.

Respectfully submitted,

T. Ling Chwang

T. Ling Chwang
Reg. No. 33,590
Jackson Walker L.L.P.
901 Main Street, Suite 6000
Dallas, Texas 75202
Tel: (214) 953-5959
Fax: (214) 661-6870

Sept. 6, 2006

Date